CLAIMS:

1. An optical storage medium for storing digital information, said storage medium comprising an optical storage layer (404, 504, 604) and a label, wherein said label comprises an electrophoretic ink layer (410, 510, 612), wherein said electrophoretic ink is light addressable.

2. Optical storage medium according to claim 1, wherein said label further comprises a photoconductive layer (412, 610).

3. Optical storage medium according to claim 2, wherein said photoconductive layer (412, 610) is located between said electrophoretic ink layer (410, 612) and the optical storage layer (404, 604).

4. Optical storage medium according to claim 2, wherein said photoconductive layer (412, 610) is located between said electrophoretic ink layer (410, 612) and a label side of said storage medium.

5. Optical storage medium according to any of claims 1-4, wherein said light addressable electrophoretic ink layer (410, 510, 612) has heat dependent switching time, such that a visual state of said electrophoretic ink changes upon heating by irradiation and applying an electric field.

6. Optical storage medium according to any of claims 1-5, wherein said label is arranged to be irradiated by a laser for addressing said electrophoretic ink.

7. Optical storage medium according to claim 6, wherein said laser also is used for recording digital information on said optical storage medium.

8. Optical storage medium according to any of claims 1-7, comprising a first electrode (408, 508, 608), a second electrode (414, 512, 614), and a voltage applying means

for applying a voltage between said first and second electrodes (408, 414, 508, 512, 618, 614).

9. Optical storage medium according to claim 8, wherein said voltage applying means comprises a receiver for radio frequency signals, a circuit for transforming said radio-frequency signal into a voltage, wherein said circuit is arranged to apply said voltage between said first and second electrodes (408, 414, 508, 512, 618, 614).

10. Optical storage medium according to claim 8, wherein said voltage applying means comprises external contacts to apply said voltage between said first and second electrodes (408, 414, 508, 512, 618, 614).

11. Optical storage medium according to any of claims 1-10, wherein said electrophoretic ink comprises electrophoretic ink microcapsules, SiPix microcups, or gyricon spheres, or any combination thereof.

12. Optical storage medium according to any of claims 1-11, wherein a product of a resistance and a capacitance per area unit of said electrophoretic ink layer (410, 510, 612) is higher than 0.001 ΩFm^{-2}, and preferably higher than 0.004 ΩFm^{-2}.

13. A method for labeling an optical storage medium provided with a label comprising an electrophoretic ink layer (410, 510, 612), comprising the steps of:

applying a voltage between a first and a second electrode (408, 414, 508, 512, 618, 614), said electrodes (408, 414, 508, 512, 618, 614) being arranged on mutual sides of said electrophoretic ink layer (410, 510, 612);

irradiating selected pixel areas of said label for addressing a change of visual state.

14. Method according to claim 13, further comprising the step of initialising said electrophoretic ink layer (410, 510, 612) by making it uniform in terms of visual state.

15. Method according to claim 14, wherein said step of initialising comprises the step of applying a uniform electric field for a predetermined time period.

16. Method according to claim 14, wherein said step of initialising comprises the step of applying a changing voltage across said electrodes (408, 414, 508, 512, 618, 614).

17. Method according to claim 13, further comprising a step of initialising, comprising the steps of:

applying a square wave voltage between said electrodes (408, 414, 618, 614) to cause capacitive voltage splitting between a photoconductive layer (412, 610) and said electrophoretic ink (410, 612) layer for erasing an existing label;

applying a ramp voltage between said electrodes (408, 414, 618, 614) to cause resistive voltage splitting between said photoconductive layer and said electrophoretic ink layer (412, 610), wherein said ramp voltage is a predetermined voltage suited for label writing in the end of said ramp; and

applying said predetermined voltage between said electrodes (408, 414, 618, 614) during a time period for writing said label.

18. Method according to any of claims 13-17, wherein said step of irradiating selected pixel areas comprises heating the electrophoretic ink of said pixel areas.

19. Method according to any of claims 13-18, wherein said step of applying said voltage between said first and second electrodes (408, 414, 508, 512, 618, 614) comprises the steps of:

generating a radio-frequency signal;

transmitting said radio-frequency signal to said optical storage medium;

receiving said radio-frequency signal at said storage medium;

transforming said received radio-frequency signal to a voltage; and

applying said voltage between said first and second electrodes (408, 414, 508, 512, 618, 614).

20. Method according to any of claims 13-19, wherein said step of applying said voltage between said first and second electrodes (408, 414, 508, 512, 618, 614) comprises the step of supplying a voltage to said optical storage medium through a connector.

21. A recorder for an optical storage medium, comprising a first light source for recording digital information on an optical storage layer (404, 504, 604) of said storage

medium, a second light source for writing a label comprising an electrophoretic ink layer (410, 510, 612) of said storage medium by addressing pixel areas of said electrophoretic ink layer (410, 510, 612), and a means for applying an electric field across said electrophoretic ink layer (410, 510, 612).

22. Recorder according to claim 21, wherein said first and second light sources are one common light source.

23. A label writer for labeling an optical storage medium, comprising a light source for writing a label comprising an electrophoretic ink layer (410, 510, 612) of said storage medium by addressing pixel areas of said electrophoretic ink layer (410, 510, 612), and a means for applying an electric field across said electrophoretic ink layer (410, 510, 612).

24. Label writer according to claim 23, comprising a positioning means (706) arranged to fit into a center hole of said optical storage medium (704) and a position sensor (708) arranged to provide a position of said label writer (700) in relation to said optical storage medium (704), wherein said label writer (700) is hand operated.